2022 H1 Q18

Section: Electricity

Topic: Monitoring and Measuring A.C.

- Count the peak-to-peak amplitude from the oscilloscope trace; the waveform spans about 6 vertical divisions.
- With a Y-gain of 2.0 V per division, the peak-to-peak voltage is about 6 × 2.0 V/div = 12 V. The peak voltage is half of this: 6 V.
- Calculate the r.m.s. voltage using $V_{rms} = V_{peak} / \sqrt{2}$; this gives about 6 ÷ √2 ≈ 4.2 V.
- Measure the period of one complete cycle. One cycle occupies about 5 divisions; at 5 ms per division, the period is roughly 25 ms.
- The frequency is the reciprocal of the period: f = 1 / 0.025 s ≈ 40 Hz.

Final Answer: B — 4.2 V, 40 Hz

Revision Tips:

- Measure the horizontal length of one complete cycle in divisions and multiply by the timebase to find the period; frequency is 1 ÷ period.
- R.M.S. voltage for a sine wave equals the peak voltage divided by √2; use half of the peak-to-peak value to find V_{peak}.
- Use the Y-gain to convert vertical divisions into volts and the timebase to convert horizontal divisions into seconds.